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CHILDREN AFTER INJECTIONS OF MEDICINALS

-USSR-

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THE TREATMENT OF ABSCESES AND FISTULAS IN  
CHILDREN AFTER INJECTIONS OF MEDICINALS

-USSR-

[Following is the translation of an article by L. A. Vorokhobov from the Clinical Hospital for Children imeni N. F. Filatova (Chief Physician, M. N. Kalutina) and the Clinic of Children's Surgery (Prof S. D. Ternovskiy -- Head of the Chair) of the II Moscow Medical Institute imeni N. I. Pirogov, in Sovetskaya meditsina (Soviet Medicine), No 8, Moscow, 1960, pages 94-97.]

In intramuscular and subcutaneous injections of various medicinal and prophylactic drugs, especially penicillin and diphtheria anatoxin, so-called "cold abscesses" are formed in children in some cases at the point of injection. Their etiology has not been definitely explained up to the present time. A number of authors suggest that they are of infectious origin. According to data of the All-Union Scientific Research Institute of Medical and Biological Drugs imeni L. A. Tarasevich, where careful pathohistological (Ya. L. Rapoport) and bacteriological (L. I. Nakhimov) research of abscesses and fistulas after injections of medicinals is being carried out, they are represented as a "syringe disease" caused by incorrect injection techniques and an insufficient sterilization of instruments. The problem of an infectious agent also remains open. The possibility of infection by a variety of tubercular microbacteria is not excluded, especially as an morphological terms this process appears to be a chronic inflammation with the presence in a number of cases of tuberculoid structures. Rendu, Debre, and others express a similar opinion.

Ya. L. Rapoport, in addition, suggests the possibility of infection by the pathogenic agent of a group of viruses. The presence in some cases of staphylococci is evaluated as a secondary exogenous infection. M. M. Kopteva denies the tubercular character of the disease and considers the mechanical defects in administering a solution of penicillin in the subcutaneous cellular tissue and not in the muscles as the more probable cause of the origin of infiltrates and fistulas after injection. The subcutaneous cellular tissue in children is loose, has a more delicate capillary network and for this reason is subjected to necrosis under a breakdown in its blood circulation.

I. I. Soboleva and A. S. Yermeyeva think that the pathogenesis of

this complication may be connected with a generally altered reactivity of the child's organism and with a local allergic condition of the tissues. Without exception all the authors consider as important for understanding the pathogenesis of this disease the fact that "cold abscesses" and fistulas which do not heal for a long time after injections of medicinals originate not in hospital patients but only after injections made at home or in dispensaries (in mass inoculations), where there is the greater possibility of breakdowns in injection and asepsis techniques.

The clinical picture of the disease is usually of one type. Within one to two weeks and in some cases within three to five months a dense, painless and little mobile infiltrate without marked inflammatory alterations of the skin appears at the point of injection. The general condition of the child is good, the temperature normal, and the regional lymphatic nodes are not enlarged.

Very slowly, in the course of three to five months and longer, the infiltrate in the center begins to soften, a fluctuation appears, and an abscess forms. The skin over the abscess thins and a bluish hyperpigmentation is acquired. After injections of penicillin and streptomycin in the buttocks and in the thigh, the form of the infiltrate is indefinite, more frequently round, and the infiltrate is always adherent to the muscles. In injections of diphtheria anatoxin, the infiltrate has the characteristic form of a dense, oval band which usually runs in an oblique direction along the entry of the injection needle and in some cases is not adherent to the underlying muscles. The dimensions of the infiltrate are quite different -- from 1 x 3 to 10 x 12 centimeters (when extended across the entire buttock). The abscess opens independently and one or more fistulas with drawn in, thinned edges are formed. In the surgical opening of the abscess, the wound does not heal for a long time and then fistulas also form.

The suppurative discharge from the fistula is not profuse and the pus is thin and odorless. There is no growth of microbe flora, as a rule, in culturing the pus in the usual media. The path of the fistula is narrow, sinuous, and covered with granulations. In wide abscesses there are several communicating, narrow paths in the cavity. It has been discovered during surgery that the abscess is surrounded by a tough, fibrous capsule. Standard treatment and the usual opening of such abscesses do not lead to complete healing. The first time the infiltrate decreases and the fistula closes but after several treatments it again recurs.

In a few cases we noticed a significant temperature reaction with marked inflammatory phenomena in the area of the infiltrate and a rapid abscess formation. In opening such abscesses we, as a rule, discovered streptococci and staphylococci in the pus. Such abscesses must be related to secondary infections.

Undoubtedly only radical surgery is effective for such patients. On the suggestion of Prof S. D. Ternovskiy, the exsection of "cold abscesses" and fistulas together with the capsule was performed beginning in 1953 in

our clinic within apparently unaltered tissues with suturation of the wound and mandatory rubber drainage which are removed 48 hours after the operation. The operation is comfortably performed with the usual anesthesia.

M. M. Kopteva reported on the first 40 patients treated by this method in our clinic (in 37 patients the abscess was completely exsected and in three only dissected). The results of the treatment were good. The wounds healed in all cases of complete exsection of the abscesses and fistulas.

Several negative sides to the method of complete exsection of abscesses and fistulas were revealed under a further study of the disease. After the exsection of a wide abscess or fistula within unaltered tissues (and only such an exsection guarantees the healing of the wound) a large scar, up to 10-12 centimeters in length, crudely retracted, and joined to the aponeuroses and muscles, was formed. In addition the patient was obliged to remain in the hospital 10-12 days. For this reason we began in 1956 to use another method of treating post-injection abscesses and fistulas.

Under a short duration, general anesthesia (ethyl chloride or nitrous oxide) we opened the abscess at the point of the greatest fluctuations and when in fistula form the fistula was dissected (the incision no longer than one centimeter). We removed (scraped off) all granulations carefully with a sharp surgical spoon [curette] and destroyed the fibrous capsule of the fistular path or abscess. As abscesses occur in numbers and the fistular path is twisting we utilized a powerful electric suction apparatus with a curved nozzle which allowed us to penetrate all "corners" of the abscess for a more complete removal of granulations. We did not suture the wound. We applied the dressing with a hypertonic solution. Within 24 hours upon an accumulation of discharge from the edges we opened the dressing and applied another dressing with a hypertonic solution. We ordered the patient to the outpatient clinic within one to two days.

In all we studied 122 patients with abscesses and fistulas after injections of medicinals (the 40 patients described earlier of M. M. Kopteva are not included in this number) after administering penicillin, 48 patients; diphtheria anatoxin, 63 patients; other medicinal and prophylactic substances, 11 patients. There were 67 boys and 55 girls. M. M. Kopteva also mentions the larger number of complications in boys. There were 38 patients from one year to three years of age, 33 patients from three years to seven years of age, 17 from seven to nine years, and 34 from nine years to 14 years.

The time lapse between injections of medicinal substances and the admission of patients to the hospital with an abscess or fistula is as follows: one to three months, 51 patients; three to six months, 38 patients; six to nine months, 15 patients; nine months to one year, 11 patients; more than one year, seven patients. There were abscesses in 83 children and fistulas in 39 children. The patients were not hospitalized but were treated in the outpatient department, with standard treatment, as in a number of cases the infiltrates resolved with physiotherapeutic

treatment. In all our patients, abscesses and fistulas appeared after injections were made at home or in a dispensary. In nine children there were two centers of affection on two thighs or on two buttocks.

The exsection of an abscess or fistula was performed on 45 patients (on the whole these were patients who were admitted before the method of curettage with suction was worked out); curettage with suction was performed on 61 patients. Seven patients had their abscesses opened only and nine patients were given standard treatment.

We only opened an abscess in the presence of an active inflammation with a high temperature and general intoxication or as a preliminary stage of treatment of very large abscesses which usually originated after injections of penicillin. Within one to two weeks after opening such an abscess, the usual curettage with suction was performed when the cavity of the abscess noticeably decreased.

Standard treatment was applied only when it had to be, when an operation was contra-indicated because of concomitant diseases (otitis, pneumonia, infectious diseases, etc.). For standard treatment we applied UHF, the drawing of pus by puncturing, and the infiltration of affected tissues with a 0.25 percent solution of novocaine with streptomycin. The standard treatment was lengthy and we discharged patients with an infiltrate or fistula. Only one patient with a large abscess of the buttock (after an administration of streptomycin), on whom curettage with suction was performed, was admitted to the hospital with a relapse and a repeated cutterage with suction was performed on him.

We examined 28 patients in the course of a month to a year after operating for the purpose of a more careful study of the results of treatment by means of curettage with suction. There were 11 patients with abscesses and fistulas after an administration of penicillin, 13 after an administration diphtheria anatoxin, one after neobenzene, one after vitamin B<sub>1</sub>, one after antipolymyelitis vaccine, and one patient after an injection of  $\gamma$ -globulin.

All the children are healthy, there are no complaints, the wounds healed within one to two weeks after discharge from the hospital; in only three patients did it take the wounds a month to heal. The scars were one centimeter in length, soft, and not retracted, and there were no infiltrates or retraction of cellular tissues.

Thus the method we have applied of curettage with suction has justified itself. A shortcoming of the method may be considered the length of time that is required for the wound to heal in some patients.

At the present time the treatment of abscesses and fistulas after injections of medicinals and preventive agents is carried out by the following method. The fistulas and abscesses are opened and then are scraped out [curettage]; the suction process is then applied. Only very large abscesses are incised, then suction with curettage is performed within one to two weeks when the cavity and infiltrate have decreased.

Recent observations have convinced us that curettage is the basic component of the method and that suction only facilitates the removal of pus and granulations from the cavity of the abscess; for this reason we

have limited the treatment of small abscesses to curettage of the cavity of the abscess without suction. In older children this operation can be performed under a local, novocaine anesthetic.

In cases when an operation is contra-indicated, standard treatment is recommended -- UHF, the suction of the pus with punctures and the infiltrating of the tissues with a 0.25 percent solution of novocaine with streptomycin, considering that there might possibly be a tubercular infection.

An explanation of the pathogenesis of the disease is not the purpose of the present article but an analysis of our material leads us to think that the cause of abscesses and fistulas after the injection of medicinals and preventive agents is a technical defect at the moment of injection. It is impossible to completely negate the infectious nature of the disease and for this reason it is necessary to strictly adhere to correct injection techniques for the purpose of prevention, especially in dispensaries and homes, and to strictly observe correct sterilization procedures of injection instruments, materials, and hands.

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